ACHIM SZEPANSKI 2022-07-12

FOSSIL CAPITAL

ECONOFICTION CAPITAL, CLIMATE CHANGE, ENERGY, FOSSICL CAPITAL, MARCISM

In 2012, global CO2 emissions were 58% higher than in 1990, causing, among other things, hurricanes to become stronger due to higher temperatures in ocean catchments and Arctic ecosystems to reach a number of tipping points. The limit at which the ice sheet in Greenland irreversibly melts and a rise in sea level of up to 6 meters can be reached is now 1.6 degrees rather than a further global warming of 3.1 degrees. Melting ice amplifies the warming because the exposed darker ocean surface absorbs more solar heat than the ice and releases it into the atmosphere, which in turn accelerates the shrinkage of the remaining ice. The mechanism is

considered a classic example of a self-reinforcing process: one and the same phenomenon, ice loss, is both a consequence and part of the cause of the temperature increase. The “ice-albedo feedback” also plays a major role in ice loss in Greenland, which has increased sharply in recent years due to glaciers flowing into the sea and increased melting in summer. The ice sheet, which is three kilometers thick in places, contains 2.6 million cubic kilometers of water. If it melts completely, this would raise sea levels by seven meters over centuries or millennia.

One must assume declining natural resources such as water, food and energy. Climate change initiated by capital – reduction of biodiversity, stratospheric depletion of ozone, acidification of the oceans, extreme weather conditions, precarious drinking water supplies, chemical pollution and the alteration of soil conditions, to name but a few, can no longer be denied. The goal of keeping global warming below 2 degrees Celsius is now receding into the distance, while investments are constantly being made in new oil fields, coal-fired factories, new airports, new highways, and so on. In 1990, the annual increase in warming was one percent, and since 2000 we have been dealing with a rate of 3.1 percent. It is a bleak fact: the more knowledge there is about the consequences of global warming, the more fossil fuels are burned. Weather patterns, vegetation types, entire collectives of organisms, and ocean warming are all a product of burning fossil fuels. So the facts are sufficiently known and they can only be evaluated in their totality. They are the product of a fossil fuel economy. Anthropogenic climate change has its causes not in the sphere of temperatures or atmospheric precipitation, but in the sphere of human practices, which, according to Andreas Malm in his book Fossil Capital, can be summarized by the term “labor.” In this context, it is not climate change in history but the history of climate that must be searched for answers.

Automobiles rely on fossil energy (a legacy of photosynthesis that dates back hundreds of millions of years), and their proliferation was enforced across vast areas and zones of the globe in the 20th century. Moreover, their existence is based on an infrastructure equipped with oil terminals, petroleum refineries, networks of roads, lobby groups, etc., factors that did not fall from the sky but were created over long periods of time, for example, by marginalizing or eliminating other methods of transportation than we find today.

Among other things, the first Industrial Revolution was about imposing and cementing fossil fuel-based technology, a poisoned fruit of history to this day, Malm said. The current climate is a product of persistent CO2 emissions in the past. Wherever you look in climate change, you’re in the stranglehold of a time stream. The transfer of carbon that started from geological reserves and led to fireplaces, then emitted into the atmosphere, set the process in motion. It takes time for a certain quantity of CO2 emissions to be recognized as a heat yield and before it has an impact in the planetary ecosystem. With each new emission added to past emissions, the concentration of CO2 in the atmosphere increases (CO2 remains in the atmosphere for several thousand years) and global warming accelerates, that is, emissions are cumulative. The emission of one ton of CO2 would not be so dangerous if there were not already trillions of tons of CO2 in the atmosphere; so it is the total accumulation that causes temperatures to rise, and the more C02 that is emitted, the lower the prospects of even being able to slow down the rise that is taking place. New studies say that greenhouse emissions have reached a new record high with

40.6 trillion tons of CO2 pumped into the atmosphere.

If a certain increase in global warming, say of 2 degrees Celsius, is to be maintained, then logically only a very specific amount of CO2 can be emitted. Even if the fossil fuel economy were destroyed in a single stroke, it would still continue to cast its dark shadow into the future. And even if emissions approached zero, sea levels would still rise over several hundred years. A warmed sea will melt Antarctic ice and destabilize permafrost or methane hydrate to set off other feedback mechanisms – all in all, climate change is also a messy mix of timescales. So it's important to remember that the 1.5 C limit, as set by the IPCC and the UN, still allows for global warming that results in more intense and frequent hurricanes, storms, and other weather events; rising floods and droughts; reduced crop yields; declining fish stocks as sea levels rise, forcing the migration of people living on islands or in low-lying regions; and ultimately, higher mortality rates and growing devastation. Climate change is generating tens of thousands of deaths a year, so the 1.5C limit must be considered a "death sentence" for many indigenous peoples and islanders. So 1.5C global warming is already to be understood as a disaster and not at all as an acceptable level of global warming.

The corporations and individuals who are causing harm to others by burning fossil fuels cannot see their victims because, for the most part, they do not yet exist. One could categorize these processes of climate change as a violence in slow motion that is not instantaneous, but gradual, as well as cascading. The longer business-as-usual is pursued in the climate arena and climate change is merely managed by states in terms of neoliberal governance, the more difficult it will be to break out of the warming trend. Each round of new pipelines, roads, and tankers loads and burdens populations with a heavy mass of infrastructure containing massive amounts of carbon over the next few decades. Thus the causal power of the past rises inexorably, perhaps to a point where it is truly too late.

One of the most disturbing findings of climate science is that global warming may not be gradual after all, representable as a smoothly ascending line on a graph, but as a series of accelerations reaching and passing various tipping points. These tipping points can take the form of a cascade. A new study suggests that changes in circulation in the oceans, which moves air around the world and is responsible for warming, could be such a driver of a cascade. Melting Greenland ice in a warmer Arctic is a key component of circulations in the oceans. Further calming of the circulation could lead to a shift in heat production across the globe as well as a collapse of the Amazon rainforest, permanent drought in Africa's Sahel, it could affect the Asian monsoons and rapidly warm the Southern Ocean, which in turn could cause an acute rise in global sea level, while the West Antarctic ice sheet would break and eventually produce a shift toward a new climate regime that researchers call "Hothouse Earth." It is important to keep in mind that sea level rise is by no means uniform across all regions of the oceans because it varies with ocean circulation, coastal structure and, moreover, coastal protection measures.

It may even be that the line indicating cascades of interrelated tipping points has already been crossed. The potential tipping points show up in three forms. Loss of ice cover, which accelerates sea level rise; forests and other natural carbon stores release the stores into the atmosphere as CO2, further warming and affecting ocean circulation. Four of the nine tipping points are promoting ice thaw. Arctic ice is rapidly disappearing, and ice loss is affecting all major ice-

based land areas, namely Greenland, West Antarctica, and the Wilkes Basin in East Antarctica. This also affects weather patterns in the mid-latitudes because the ice affects the re-radiation of solar energy, precipitation, the supply of water vapor to the atmosphere, and the flow patterns of air in the atmospheric circulation.
The Amazon suffers from recurrent drought and forest dieback. In the northern coniferous forest belts, rising temperatures are causing prominent forest fires, permafrost is thawing and releasing methane; in the tropics, coral reefs are disappearing, affecting ocean ecosystems. In climate research, not all physical interactions have been understood and represented in climate models for a long time. Global warming does not necessarily lead to an increase in temperatures across the globe. Thus, the global mean temperature is a measure that relates to determining and communicating how climate change will continue; it is a scientific construct that mostly uses probability theory. This measure describes the total increase of thermal energy in certain layers of the atmosphere, although it is by no means clear how the higher energy affects seasonally and locally, because this depends on a whole series of factors, such as the specific distribution of land, ice and sea, the structure of mountains and large areas of vegetation. This results in the emergence of certain flow patterns and weather events, where the increase in energy input, which occurs differently due to the interactions at the surface of the earth, water or ice, leads to a destabilization of the known flow patterns and weather processes.

It is widely known that 10% of humanity is responsible for half of all current emissions of CO2 that come from consumption. The richest 1% has a CO2 footprint 175 times greater than that of the poorest 10% of the world's population. The emissions of the richest 1% in the USA, Saudi Arabia and Luxembourg are two thousand times higher than those of the poorest inhabitants of Honduras, Mozambique or Rwanda. But the biggest air polluter in the world is the American military. If it were a country, its consumption of fossil fuels would make it the 47th largest emitter of greenhouse gases in the world. Consider the world-historical inefficiency of the U.S. military, the planet's largest oil consumer and, not surprisingly, the planet's most important oil policeman. The Pentagon is an accounting black hole from which no light emerges.
Most will say that the answer to all these problems is to tax dirty energy or ban CO2 emissions altogether and subsidize clean energy. A reasonably applied CO2 tax could supposedly tip the scales in favor of renewables until they are able to fully replace fossil fuels. New fossil sources and infrastructure could be banned, and the revenue from the taxes could be used to fund research into new technologies, increase efficiency, and encourage consumers.
But under any conceivable scenario of this sad, warmed planet, any Green New Deal also fails because of capitalism. For under capitalism, the class of owners and managers are competitively forced to make a series of decisions about where and in what to invest, setting prices, wages, and other basic determinants of the economy. Even if these owners wanted to prevent sinking cities and billions of migrants by 2070 by investing heavily in climate change mitigation, they couldn't. So their hands are tied, their decisions constrained by the fact that they must sell certain goods on the market at least at the currently existing price or simply perish. It is the class of capital as a whole that decides here, not its individual members.
The drive to relentless growth and thus increasing energy consumption is not chosen, it is

structurally enforced. Tax oil in one country and capital will sell it elsewhere. If the demand for raw materials increases, then capital will drive up the price of raw materials and bring the materials to market in an energy-intensive way. If capital needs millions of square miles for solar panels, wind farms, and biofuel crops, it will drive up the price of real estate. If you put tariffs on necessary imports, capital will move to cheaper markets.

There are 1.5 trillion barrels of proven oil reserves on the planet, with a value of about $50 trillion, assuming a very low average cost per barrel of $35. This is a value that oil companies have already factored into their mathematical calculations. If CO2 taxes or bans increase that number tenfold, the fossil capitalists will do everything they can to avoid, undermine and repeal the tax. For comparison, there is about $300 trillion in total wealth on the planet, most of it in the hands of the capitalist owner class. The global gross domestic product, the value of all goods and services produced in a year, is about $80 trillion. When someone proposes to eliminate $50 trillion, one-sixth of the wealth on the planet, equivalent to two-thirds of global GDP, one would expect the owners of that wealth to fight that force with everything they have. For example, while the New Deal served only to restore growth, the Green New Deal must generate growth and reduce emissions. The problem is that growth and emissions are strongly positively correlated in almost all areas. So the Green New Deal threatens to become a kind of Sisyphean reform, rolling the stone of emissions reduction up the hill every day, only to be brought back down to earth every night by a growing, energy-hungry economy.

In times of global warming, the iron laws of economics and geophysics are forcing the effects of the damage done in the past. This is certainly more than a gradual progression; extreme weather events abruptly intensify the slow violence of the climate and also create a photogenic spectacle for the masses in the comfort zones: Think of the water floods in Pakistan or the fires in the Amazon. The point of “it’s too late” is getting closer by the day, and the closer it gets, the sharper and more comprehensive the cuts in emissions will have to be.

In these contexts, Andreas Malm asks the crucial question for his book Fossil Capital: what should we understand by a fossil economy? A first simple answer would be: an economy with sustainable structural growth based on increasing consumption of fossil fuels and therefore generating a continued increase of CO2 in the atmosphere. The main driver of this “business as usual economy” emerged during the first industrial revolution, which for the first time in human history produced sustained economic growth that was not episodic. And in the wake of the laws of thermodynamics, we know that no growth can feed itself, it always relies on the dissipation of natural resources. The fire of modern growth reproduced an economic gas that demanded more growth, which put the feedback – and in this respect it was sustainable – on a higher and higher ladder. The fossil economy was born when this fire was forced by the material of fossil energies. But fossil energy is only one cause of global warming; deforestation historically accounts for a quarter of CO2 emissions since 1870 and currently represents 8% of emissions, while fossil fuels account for the rest. There are also other greenhouse gases – methane, sulfur, ozone, dioxides, etc. – whose history would also have to be written. If the increase in CO2 emissions were stopped and emissions remained constant, the concentration in the atmosphere would still increase, because what counts for the climate is the absolute amounts of CO2 in the atmosphere. Ultimately, it is the economic expansion and the associated consumption of fossil

fuels that are mainly responsible for the emissions to date, and this at still increasing levels. Andreas Malm translates Marx's thesis of the increasing organic composition of capital (the rate between dead and living labor) into an increasing fossil composition of capital. Over a longer period of time, then, the tendency of capital to reduce the proportion of human labor relative to that of machines can be translated into the law of increasing concentration of CO2 in the atmosphere. This dynamic was first found in England in the 19th century during the consumption of coal, which was necessary for textile trade and production.

The tendency of capital to increase its mobility and flexibility paradoxically always ends up investing more fixed capital in means of production, infrastructures and means of transportation, structures that are not at all climate friendly. When capital deploys new fixed capital, it wants to use it until its value has been completely used up and transferred. Moreover, the basis for the continuous consumption of fossil fuels also has to do with the geographic conditions of fixed capital, as evidenced, for example, by the fact that 2/3 of the U.S. power plants created since 1890 are still in use.

The fossil economy has the violence of a totality, an indivisible unity: it is a socio-ecological structure in which a certain economic process and a certain form of energy are interwoven. From a certain point in the 19th century, entrepreneurs in England obtained the energy for their businesses from the nearest lignite field and just did not build more water mills, they transported their products on merchant ships and just not on sailing ships, and later they preferred the car and the plane as an option for travel and transportation. All in all, fossil energy is a historical substance. So where to start?

The fossil economy undeniably has its birthplace in England: the country was responsible for 80% of global CO2 emissions in 1825 and for 62% in 1850. Thus, the Industrial Revolution is the archive for this historical fact. At first, the transition from natural resources (water) to fossil energies (coal) was still slow. Furthermore, the transition from water to coal required new technology, manpower, scientific research, etc. The profit motives of the industrial revolution were the first ones. It was first the profit motives of the small and medium enterprises that drove the innovations in the energy sector. Fossil fuels won the race over water because they were the cheapest in the end, and it is no different today in terms of prices with renewables if they are to win the race over fossil fuels.

The material for the increase in the use of fossil energies was first the coal, which, however, had been burned in Britain for hundreds of years, but it was the industrial revolution in which there was a rapid increase in the burning of coal in factories, through the transformation of heat into motion, or the conversion of thermal energy into mechanical energy, and this by means of the means of production steam engine. In the first steam engines, coal was burned to move the piston up and down in vertical motion. In a steam generator, which is part of the machine, energy is produced by combustion, and the thermal energy contained in the steam is converted into mechanical work by means of pistons. Another source of propulsion was the continuous rotation of wheels. It was James Watts who discovered the usefulness of burning coal for wheels. The piston produced a continuous circular motion, making the engine useful for making all sorts of products. The rotating engine could now power a machine that was the first linchpin of sustained economic growth that increased output per capita, i.e., improved the productivity of

labor.

As a source of thermal energy, coal was useful for a whole number of processes, but only as a source of rotating mechanical energy could it drive the production of all sorts of products. A rotating machine could also power a vehicle – the second moment of sustainable growth – which, by moving wheels, allowed travel over land and sea to transport goods to and from the mill. Heat could act on materials with certain chemical properties, pumps could move fluids, machines and vehicles could produce and transport a range of goods, and powered by the combustion of coal, it was precisely the steam engine that made fossil fuels ubiquitous for the production of goods. It is important to remember that thermodynamic force and social power are not separate domains. (Force is a rate of energy flow, or W=J/s, J for joules, s for seconds, and W for watts, the unit of force). Thus, the force emanating from fossil fuels was dual in meaning and nature from the first moment; the two realms constituted into one by interpenetrating.

Global warming has no natural causes, such as volcanic eruptions, increased solar radiation, or other natural phenomena. Fossil fuels are primarily a materialization of social relations. And fossil fuels require human labor as a condition of their existence. It is labor where humans and nature meet and with which biophysical resources enter the circuits of social metabolism where coal, natural gas, and oil are extracted and transported and come into contact with machinery through combustion. Workers are the first interface between economy and nature.

Let us now turn to the industrial revolution in England. It was first water that was used to produce cotton, before the steam engine was used in factories to produce textiles. Malm attempts to provide a historical explanation of why and how steam power replaced water as the “prime mover” of the emerging industrial age. In doing so, he distinguishes three forms of energy: a) streams of energy not captured by photosynthesis and suitable as wind and water for concentrated use by machinery, but remaining dependent on landscapes and weather, b) life force refers to sources of energy embodied in living creatures and shaped by the imperatives of metabolism, and c) energy as stock consists of the relics of stored solar energy from the past that must be extracted from the ground by humans. The history of the Industrial Revolution is the substitution of the latter for the first two forms of energy, under very specific economic conditions and phases of class struggle. Early industrialization in England was still based, in terms of energies, on vital force and water, specifically water mills, while the burning of coal during this period consisted only of providing heat for factories and homes.

During the first industrial revolution, the water mill was fundamentally at odds with the conditions necessary for capital, insofar as natural features such as weather conditions and landscape did not allow for the urban concentration and discipline of labor in the factory. Rather than continuing to be exposed to the conditions of nature, capital created its own matrix of points and arteries that set in motion a circuit: abstract space, which held the possibility of accumulation at a point and the possibility of accumulation of capital. But even the abstract space is based on natural resources and it is still the fossil fuels that have the properties necessary for this abstract space. They do not diffuse on the surface of a landscape, but are concentrated in deposits in the ground. Their concrete property as raw material is at the same time their abstractness. Coal was the optimal raw material for spatial abstraction, could circulate fragmented piece by piece, be burned, and thus fuel the forces of accumulation.

Analogously, we get to deal with an abstract temporality, with the right of the capitalist to use labor power in production for a certain period of time. In this period of time, the worker is supposed to work as much as possible for single capital, at least as much as the workers of competitors, in order to increase productivity as much as possible (the output measured within a fixed unit of time.) Abstract temporality inheres time as an independent variable or mathematical unit, as an incorporeal event not based on natural fluctuations or changing weather. It is considered the measure of an activity. If the work was done faster and more intensively, it had to be done with the "prime mover" (steam engine) and all pores of interruption of production had to be eliminated. Therefore, the higher labor productivity was based on the steam engine, and this conformed to the necessities of capital that the machine could be turned on and off ad hoc and increased in speed as needed. Such characteristics were the consequence of the essence of fossil fuels, their distance from visible natural rhythms, as they were in the ground. Frozen in time, coal was congenial to the abstract time of capitalist property relations and the capitalist supervision of workers in factories.

Abstract space and abstract time together form what Malm calls a distinctive space-time of the capitalist mode of production. Capital does not circulate in space and through time as if there were two fixed axes along which it develops; rather, it produces its own abstract space-time. One dimension is inseparable from the other and together they constitute a singular spacetime. The necessary substratum for this spacetime are the fossil fuels. They represent the geological compression of time and space, their dense energy allows capital to produce its own spacetime to extract the surplus of nature. And space-time began to have a lasting effect on the atmosphere with the mining of coal. The depth of capital's dependence on nature is fully developed when CO2, produced by burning fossil fuels, is endowed with a transformative power like no other anthropogenic substance.

A stronger demand for steam power from industry did not emerge until an overproduction crisis in the 1820s. Ure saw in it the possibility of liberating production from dependence on laborers. As spinning mills gradually became mechanized, weaving initially remained part of a widely dispersed cottage industry, with workers paid low wages and difficult to discipline. The replacement of water mills with steam power, on the other hand, allowed the creation of a combined factory, an integrated production process under one roof, with the indiscipline of workers permanently curtailed. Steam power, from this point of view, was a manifestation of the class power of capital.

Orthodox positions, referring to the writings of Ricardo and Malthus, take the shift from water to coal as a movement reflecting the scarcity of water useful for industry and, moreover, the falling cost of coal as fuel, all of this occurring as the result of the operation of market forces. However, Malm decisively shows that during the first industrial revolution there was neither a scarcity of water, nor was water more expensive than steam power or technically inferior to it. Engines based on steam power at that time still required expensive coal and were often unpredictable due to disastrous breakdowns. However, steam power also had its advantages over water, in that the management of water power depended on cooperation between competing owners of mills, while steam engines, although more expensive than water mills at the time, could operate independently. Owners of mills powered by steam were also independent of geographic

conditions, and this allowed production to be concentrated in cities, where there was also a sufficient contingent of available cheap labor at the time. Thus, the existence of a fully integrated factory required a large concentration of workers, while cities attracted workers precisely because of the availability of "unskilled jobs." Moreover, cities were able to provide a semi-functioning infrastructure. Cities expressed a spatial crystallization of the wage relation. And in this context, steam was favored by capitalists over the water mill because of its mobility in space. The rapid growth of Manchester, the "Cottonopolis" of the time, was an expression of this development. For the first time in history, machine and energy source – engine and mines – were spatially separated from each other, allowing at the same time the high concentration of factories in cities, or, to put it another way, the stream was stationary and the stock was in motion. The poor conditions of production aroused the resistance of the working class, especially in the general strike of 1842, when mills and mines were attacked with the slogans "Stop the Smoke". The emission of carbon was thus inseparable from the imposition of specific economic conditions; it was an expression of the movements of a fossil capital.

Before going into further details of this transition of technologies, we deal with Marxmodel of reproduction and its extension, which is sui generis also one of fossil capital. In Capital Vol. 2, Marx assumes three circuits of industrial capital, namely money capital, productive capital (constant and variable capital) and commodity capital, where he summarizes the entire circuit of capital in the process formula G - W (PM, AK) ... P ... W' - G' (G for money, W for commodities and P for production; AK for labor power, PM for means of production). Foreign or own money capital is the engine for industrial enterprises that buy goods (means of production, buildings, energy, raw materials, software, etc.) and hire labor so that products enriched with surplus value can be produced and also realized,so that there is a new formation of money capital. Machinery, energy, products or production processes are not capital in themselves. Marx has shown that the above formula is the decisive expression of all the economic relations corresponding to capital, and in it, of course, production is included, which functions as a purely functional process, a process for the production of profit. Capital binds the production process ever already to its monetary metamorphoses or to the (monetary) total circulation, i. e. production is to be understood as a function and phase of the circulation of capital (in the second comprehensive sense), whose general form can be inscribed in the following formula: G-W-P-W'-G'. In this, the conceptual difference between labor power and labor for the explanation of surplus value is also spanned. It is not labor but labor-power that is bought and sold, Marx writes, and labor-power is bought at its value and its use in the production process as labor results in a greater value than it is itself. Marx considers this to be the crux of his economic analyses, which lead to the concept of surplus value. And labor transforms into dynamis or living potentiality with respect to the production of surplus only where a

capitalist techne or technology, among other things, accesses it as the transformation of labor power into labor. And the economy of time strikes when in the process of production the use of labor power produces greater value than it itself costs. As time beyond that which its reproduction requires, labor-power performs unpaid labor, the result of which is represented in surplus-value. From the outset, therefore, surplus value is to be understood as the result of the simultaneity of a non-simultaneity, insofar as exchange and use of labor power interlock as symmetry and asymmetry; surplus value arises from asymmetry-within-symmetry. Let us now turn to the formulas. Capital production is production of exchange values by means of nature, a substratum subsumed under the logic of the quantitative. The P stands for production or for the metabolism between the worker and nature. For capital, production is a simple mediation, an evil necessity to be accepted. And the circuits of capital are immoderate, so that after the return of profit the circuit must be completed again on an extended ladder: G-W-G– G-W-G”-G”-W”-G”etc. The money must be constantly reinvested to maintain capital accumulation or extended reproduction. This also requires production on a higher ladder, so that capital production can be assumed as a spiral. For each further cycle, capital also requires a greater quantity of natural materials, or, to put it another way, the accumulation of capital is realized through an increase in the productive consumption of the material, that is, through higher reserves and resources of biophysical materials that are extracted from nature to return as garbage to the world's landfills at the end of the cycle. And this spiral, so to speak, is sustainable: the more biophysical resources are withdrawn from the earth, the more resources the next round of production requires. If output were fixed, then there could be no reinvestment in new machines and workers. Capitalist property relations are thus characterized by: a) the infinite potency to produce profit, b), the compulsion to do so ceaselessly, and c), the need for the productive consumption of more and more natural materials. Capital, in its search for the cheap four (labor, raw materials, energy, food; see Moore), registers no limits in nature; rather, it circulates like an ascending perpetual motion machine. The appropriate place for the spatial concentration of capitalist property relations is the factory, which at the same time points to something else, namely, that every enterprise needs a suitable infrastructure, which only the city can provide. The concentration of proletarians in the city is the reverse of the emptying of the population from the countryside. It is also a necessary condition for the production of surplus value. And if there are no idle workers knocking at the factory gates, then the working class is in a strong bargaining position. So the

dead weight of the industrial reserve army must be there, in the form of a large, dense market for laborers who, with no property except ownership of their own labor power, must be accustomed to a disciplined life so that wage labor becomes the normal mode of their daily lives. The city is the site for all these processes. Malm then comes at this point to the exposition of the general formula of fossil capital. At a certain stage in the development of capital accumulation, fossil fuels become a necessary material substratum for surplus-value production, that is, they are used across the whole range of commodity production as a material that sets something in motion. They become the general lever for surplus value production. If F stands for fossil fuels as a part of the means of production, then it can be written down: G-W...P...F-G.

Fossil fuels are now circulating within the metabolism of productive consumption in ever increasing quantities, and this with a necessary by-product of which even Marx and Engels were aware: Higher amounts of CO2 in the atmosphere are part of production. The formula is now: G-W…P (CO2)…G Since fossil energy now feeds the perpetual motion machine of capital accumulation, a raw material that seemingly never runs out, the formula on an extended ladder of stages is: G-W...P (CO2)...G– G-W… P(CO2')...G" etc. The fossil capital is an extended value that entails the metamorphosis of fossil fuels into CO2. It is the triangular relation between capital, labor and extra-human nature, and moreover, a process that involves the productive consumption of higher quantities of fossil fuels at each stage. In contrast, the cycle of individual consumption of fossil fuels, such as driving a car, is: W-G-W(F/CO2) The F in the formulas, of course, must also come from somewhere, it must be offered to the market as a dead thing, so to speak, by a capitalist, a capitalist for whom fossil fuels are not an input but an output. This concerns the business of extracting gas, oil and coal. The formula for this primitive accumulation of fossil capital is: G-W...P... G (F)

Thus, in order to productively consume fossil fuels as an industrial capitalist, or to engage in the private consumption of fuels, it requires a capitalist who is specialized in the production of these fuels and for whom this is a process of profit production, if he realizes his supply in the markets. Within a fossil economy, the circuits of productive and individual consumption of fossil fuels are inextricably intertwined with their primitive accumulation. Important part of the general conditions of the accumulation of capital is thus the primitive accumulation of fossil fuels, that is, for capital to burn fossil fuels depends on that capital which is specialized in the production of the fossil fuels, and if the former capital burns more coal, the latter capital must supply the fossil fuels in greater quantities, that is, the two circuits must be closely intertwined.

Malm's text discusses the post-2000 CO2 emissions explosion, which came from one country in particular, the PRC. Between the years 2000 and 2006, China was responsible for 55% of global emissions of CO2. In 2002, China became the largest producer of fossil fuels. This explosion was clearly related to globalization. Indeed, from 1980 to 2008, world trade grew by 8% per year, but

the real novelty was in the boom of foreign direct investment flowing into China. In 2008, twice as much FDI flowed into China as Russia and India combined, and two years later China replaced Germany as the world's largest exporter.

In this context, CO2 emissions are about both individual consumption and the process of production that emits CO2. A German wearing a T-shirt from Bangladesh does not emit CO2, rather the CO2 emission occurred during the production of the T-shirt in Bangladesh, when the power plants provided electricity; an invisible chain was created here, which was finally embodied in the goods. So the current volume of CO2 emitted by consumers of individual goods goes far beyond the borders of their home country. What happens when Bangladesh is held responsible for C02 emissions, where the benefits of T-shirt wearers in the core countries of capital lie with their individuals? Many researchers, activists, and policymakers are relocalizing responsibility for C02 emissions in this regard, a shift from counts based on production to counts based on consumption, which is at least somewhat more realistic about how and why people should be held responsible for C02 emissions. Again, China plays a central role; while exports accounted for one-third of the increase in C02 emissions from 1990 to 2002, the rate rose to half from 2002 to 2008.

The mountains of goods from China mostly ended up in the core capitalist countries. While China was the largest exporter, the U.S. was the largest importer of goods in terms of already embodied emissions. The argument could now go like this: The share of emissions that comes from exporting goods is large and significant, as evidenced by the fact that China is still considered a world factory in international trade. And those who consume the goods from China should also bear responsibility when it comes to C02 emissions. But, and this is important to point out here, it was not the consuming workers from the US or those from the other Western countries who made the decision to invest abroad and outsource production.

Global mobile capital will always move factories to places where cheap labor can be found, i.e. where the rate of profit will be highest, and this is done with the productive consumption of means of production that require massive consumption of fossil fuels. Such mobility makes a deep cut in abstract space: in the course of maximum profitability, capital plunders resources all over the world without prohibitions as never before, while workers are always tied to specific places. Mobility is not a luxury for capital but a simple necessity, abstract space being not only a product of capital but also a consequence of class relations and struggles. When capital circulates in world markets, it urgently needs to take into account the working conditions in each country. It seeks cheap and disciplined labor, because the simplest indicator of high profit rates is low labor costs. The industrial revolution therefore tends to move from countries with high average incomes to countries with low incomes, initiating a process of relative relocalization of capital on a global scale. But things are not quite that simple, because foreign direct investment is determined by other factors besides wages, such as domestic consumers having sufficient purchasing power to consume.

In the abstract space of the global economy, customers can be served from practically anywhere; the areas of production can be separated from the areas of consumption. There are several factors that link the mobility of capital to energy stocks. A necessary condition for cheap labor is the existence of an industrial reserve army of workers, with the expansion of fossil energy

consumption often accompanying relocalization by capital. CO2 is also emitted by factories based on foreign direct investment, and for this to happen, foreign capital must stimulate the development of extensive infrastructure in the host country. Never will capital invest in a country without sufficient infrastructure. There simply must be power plants, mines, and electricity lines that provide usable and cheap energy. Malm calls these processes the expansion of effects. In this process, poor countries have a higher emission intensity than rich countries. So more CO2 is emitted when a T-shirt is produced in Bangladesh than when the shirt is produced in Germany. We are not dealing with a shortage here, but with an increased carbon increase and thus with an increased concentration of C02 in the atmosphere. So we are dealing with the intensity effect. There also needs to be a network of roads, railways, ports and warehouses for the necessary infrastructure – airports to transport finished goods, managers and CEOs, between factories, markets and corporate headquarters. Since modern transportation systems are almost entirely dependent on oil, we are also dealing with increasing emissions of CO2. Malm calls this the integration effect.

When you combine the three effects, you get a better sense for the thesis that capital is consuming more fossil energy in search of added value.

From 1990 to 2008, China increased industrial output by a factor of 26, while foreign direct investment increased by a factor of 332. Thus, the growth of exports has more to do with foreign firms locating their production facilities in China than with China's undercutting of other firms' prices on the world market. After 2000, trade, agriculture, and other service industries reduced the part of coal in their energy mix, while industry in China was responsible for more than 90% of coal consumption, with 3/4 going to heat and power generation. Coal – electricity – production of goods for export, that's the chain. It is by no means true that industrial production is less important for capital today; on an international scale, it weighs heavier than ever before. Because of its hunger for energy, China has even had to import coal since 2000, and in 2002 only the U.S. consumed more oil than China; in 2007, half of its oil was imported. At the same time, there was massive infrastructure development, see transportation, communications, and there was ample supply of water, electricity, and natural gas for capital.

About 18% of the global CO2 concentration in the atmosphere in 2002-2006 came from the rising carbon intensity of the global economy, centered as we saw on China. Coal is the dirtiest and the most productive energy when it comes to CO2 emissions. China is rich in coal, poor in oil reserves, and lacks natural gas. China had low wages and high carbon intensity, other countries had high wages and low carbon intensity, so capital flowed from the latter countries to China. And large amounts of money flowed into developing industry-friendly infrastructure in China. High amounts of CO2 have been emitted globally since the 1990s from the transportation of raw materials and other materials; it has been much less from the transportation of finished products. If Manchester was the smokestack of the world during the first industrial revolution, China was in the 21st century because capital continues to use China as its universal factory. However, after 2010, China saw wage increases, to which China responded by increasing automation in production.

Let's move on to the law of rising atmospheric concentration of C02. The flow of Chinese migrant workers from the countryside to the cities kept wage costs low for a period of time, but this was

not only in China, but in the whole world, so that the Chinese reserve army mutated into a global reserve army. At the same time, it could be said that where capital flows, there is class struggle. And where capital flows, higher C02 emissions will follow. Or, the stronger capital becomes, the more unbridled C02 production. From 1870 to 2014, a quarter of all cumulative C02 emissions have occurred in the last 15 years.

Malm briefly establishes the relationship between the technical composition of capital (the ratio of labor to materials and machinery), the organic composition of capital (the value expression of technical composition), and the rate of profit (m/c+v). In this process, the technical composition of capital can increase even if the organic composition does not, and this leads to higher material consumption. From an ecological perspective, only the latter counts, because material consumption is accompanied by an increasing consumption of energy, which means that the fossil composition of capital also increases. To date, carbon intensity is increasing. The falling rate of profit may be a trend, but the rising concentration of CO2 is immutable. Fossil capital is the driving force of a fossil economy and therefore must be attacked in the event that climate-protective measures are enforced, pointing to coming class struggles.

Thus, the power of the workers in the coal mines, together with that of the workers at the port and in transportation, repeatedly led to general strikes, to which the capitalists responded in the long run by reswitching, consuming oil from the Middle East. This was also done to decisively weaken the power of the coal workers. The extraction of oil in the 20th century required only a small labor force, which was also under permanent management supervision. Because of its liquidity, the transportation of oil also required only a relatively small input of human labor. From the mid-twentieth century, the focus of oil production was in the Middle East, creating a new spatial fix. But the problem of resistance continued as Palestinian guerrilla fighters blew up oil pipelines and more general strikes by workers occurred, think of Iran in 1979. In no case, however, did the shift from one fuel to another and from one area to another lead to an absolute fall in fossil fuel consumption. And coal has not yet disappeared from the scene; in fact, coal is responsible for more C02 emissions than any other fossil fuel. Wherever fossil capital appears, coal mining results in contaminated water, dried-up rivers, reduced vegetation, and the emission of toxic chemicals.

And the consumption of oil also requires infrastructure (refineries, pipelines, etc.) to be permanent. And so the quest for mobility ends up fixing ultra-heavy means of production and transportation over an extended period of time. Today we are dealing with an extensive network of infrastructures, oil and gas fields, huge oil tankers, pipelines, coal trains and refineries – thousands of kilometers of transportation routes, and capital has a direct interest in maintaining landscapes where fossil fuels are extracted. Limiting temperature rise to 2 degrees Celsius would require eliminating infrastructure faster than new infrastructure is being built and expanded. But the opposite is happening. More coal-fired power plants were built in the first decade of the new millennium than in any previous decade.

And with every opposition, you're up against a powerful group of companies: In Fortune's list of the world's 500 largest companies, Royal Dutch Shell ranks No. 1, Exxon Mobil No. 3, Sinopec No. 4, BP No. 6. Only three companies in the top ten have their business base outside the primitive accumulation of fossil fuels: Walmart, VW, and Toyota. In 21010, when climate change was at the

top of the political agenda, banks' investment in mines and coal-generated energy doubled. JP Morgan Chase, Citigroup, Bank of America, Morgan Stanley and Barclays threw large sums into the fossil fuel cycle. In addition, a wider climate-industrial complex has developed that includes a new global climate security market. The construction of fortifications, whose purpose is to stop rising sea levels and migrants while deporting them, has led to one of the fastest developing industries, whose height is expected to reach $742 in 2023. The climate-industrial complex is composed of private companies that profit from climate-related events and migration when states use their security industries to calm the situation. These companies profit even when security efforts fail and migrants without official status live as criminals who are deported or imprisoned. Private camps earn enormous sums when their lobbyists ensure that migrants stay in the camps as long as possible.
A specific set of demands could decisively weaken Fossil Capital:

1. enforcing a moratorium on all new facilities that extract coal, natural gas or oil.
2. the closure of all power plants that produce on the basis of fossil fuels.
3. the generation of electricity by non-fossil sources, especially wind and solar energy.
4. the restriction of air, sea and road transport. The conversion of road and sea transport to electricity and wind. The fair distribution of the remaining air traffic until it can be replaced by other forms of transport.
5. the development of public transit systems at all levels, from subways to high-speed intercontinental trains.
6. limiting the transport of food by ships and airplanes and promoting regional cultivation.
7. stopping the burning of tropical forests and initiating a large-scale reforestation program.
8. renovating old buildings with thermal insulation and equipping all new buildings with materials that reduce carbon emissions to zero.
9. limiting the meat industry and replacing human protein consumption with plant sources.
10. the use of public investments for the development and diffusion of the most sustainable and efficient technologies for the consumption of renewable energies as well as for the elimination of CO2.

translated by deepl.

← PREVIOUS NEXT →

AUTHORS
ALL INPUT

SOCIAL

FACEBOOK
INSTAGRAM
TWITTER